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09/678,414	10/02/2000	David W. Carlson	NSC1-H1700 [P04797]	4381

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LAW OFFICES OF MARK C. PICKERING
P.O. BOX 300
PETALUMA, CA 94953

EXAMINER

KEBEDE, BROOK

ART UNIT PAPER NUMBER

2823

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/678,414

Applicant(s)

CARLSON, DAVID W.

Examiner

Brook Kebede

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-7,9,10,13-17 and 19-28 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 1,2,5-7,10,13-16 and 19-28 is/are rejected.

- 7) ☒ Claim(s) 9 and 17 is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The amendment filed on March 25, 2002 in Paper No. 6 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Applicant amend in the specification in Paragraph 5, Page 6 as follows: "As shown in Fig. 3C, **a layer material 342 that lowers resistance** is formed over planarized polysilicon layer 340." Although there is support for formation of "the layer of third material over planarized layer material," there is no support for a layer material 342 (i.e., the layer of third material) that lowers resistance as the specification as originally filed. Applicant is required to cancel the new matter in the reply to this Office Action.

2. The amendment filed on March 3, 2003 in Paper No. 16 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Claim 22 recites the limitation "forming a layer of third material on the planarized layer of the first material, **the third layer of material lowering the resistance of the first material**" in lines 13-14. However there is no support for the limitation "**the third layer of material lowering the resistance of the first material**" in the specification as originally filed.

Claim 25 recites the limitation "The method of claim 24 and further comprising the step of forming a layer of third material on the planarized layer of material, **the layer of third**

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material and the layer of first material being selectively etched during the selectively etching step” in lines 1-3.

Claim 25 being dependent of claim 24, the selective etching process provides support for selectively etching for the layer of the first material as the specification as originally filed.

However, there is no support for the limitation “the layer of third material being selectively etched during selectively etching process” as recited in claim 25. Therefore, there is no support for the limitation “**the layer of third material being selectively etched during selectively etching process**” in the specification as originally filed.

Claim 26 recites the limitation “The method of claim 25 wherein the layer of third material is conductive” in line 1. Although there is support in the specification for the “third material,” there is no support for the third material being “conductive” as the specification originally filed.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 19-22, 23, 25 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 22 recites the limitation “forming a layer of third material on the planarized layer of the first material, **the third layer of material lowering the resistance of the first material**” in lines 13-14. However there is no support for the limitation “**the third layer of material lowering the resistance of the first material**” in the specification as originally filed. Therefore, the subject matter is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 25 being dependent of claim 24, the selective etching process provides support for selectively etching for the layer of the first material as the specification as originally filed. However, there is no support for the limitation “the layer of third material being selectively etched during selectively etching process” as recited in claim 25. Therefore, there is no support for the limitation “**the layer of third material being selectively etched during selectively etching process**” in the specification as originally filed. Therefore, the subject matter is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 26 recites the limitation “The method of claim 25 wherein the layer of third material is conductive” in line 1. Although there is support in the specification for the “third material,” there is no support for the third material being “conductive” as the specification originally filed. Therefore, there is no support for the limitation “**the layer of third material is conductive**” in the specification as originally filed. Therefore, the subject matter is not described

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in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 19, 20, 21, 23 and 26 are also rejected as being dependent of the rejected independent base claim.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 5, 13 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation “wherein the layer of first material is formed such that the first lower level lies above the wafer above level by **a value that equal or grater than the thickness**” in lines 4-5. By value of what ? Is that the thickness ? Is that density ? Is that height ? Is that width ? However, the recited limitation lacks clarity in its scope and meaning because the recited limitation “value” has no meaning in the claim language. Therefore, the claim is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation “wherein the layer of first material is formed such that the first lower level lies above the wafer above level by **a value that equal or grater than the thickness**” in lines 4-5. By value of what ? Is that the thickness ? Is that density ? Is that height ? Is that width ? However, the recited limitation lacks clarity in its scope and meaning because the recited limitation “value” has no meaning in the claim language. Therefore, the claim is

indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 recites the limitation “wherein the layer of first material is formed such that the first lower level lies above the wafer upper level **by a value that is equal or greater than the minimum thickness**” in lines 2-5. By value of what ? Is that the thickness ? Is that density ? Is that height ? Is that width ? However, the recited limitation lacks clarity in its scope and meaning because the recited limitation “value” has no meaning in the claim language. Therefore, the claim is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Applicant’s cooperation is requested in reviewing the claims structure to ensure proper claim construction and to correct any subsequently discovered instances of claim language noncompliance. See *Morton International Inc.*, 28USPQ2d 1190, 1195 (CAFC, 1993).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 2, 5-7, 10, 13-16 and 19-28 rejected under 35 U.S.C. 102(e) as being anticipate by Li et al. (US/6,162,368).

Re claims 1 and 16, Li et al. disclose a method for forming a planarized layer of material on a processed wafer, the wafer having a top surface, the top surface having spaced-apart wafer

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upper levels a wafer lower level that lies between the wafer upper levels, the wafer upper levels lying above the wafer lower level, the method comprising the steps of: forming a layer of first material (16) on the top surface of the wafer (10), the layer of first material (16) having a top surface, the top surface of the layer of first material having a first lower level and a first upper level that lies above the first lower level; forming a layer of second material (60) on the top surface of the layer of first material (16); and chemically-mechanically polishing the layer of second material (18) and the underlying layer of first material (16) with a slurry until the layer of second material (18) is all removed from the layer of first material (16) to form the planarized layer of material; and wherein the layer of first material makes an electrical contact with a device on the wafer, the planarized layer of material lying over the wafer upper levels and the wafer lower level (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 2, as applied to claim 1 above, Li et al. disclose all the claimed limitations including the limitation wherein the first lower level lies above the wafer upper level (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 5, as applied to claim above, Li et al. disclose all the claimed limitations including the limitation wherein the planarized layer of material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the thickness (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 6, as applied to claim 1 above, Li et al. disclose all the claimed limitations including the limitation the first material as being polysilicon (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 7, as applied to claim 1 above, Li et al. disclose all the claimed limitations including the limitation the second material is being an oxide (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 10 as applied to claim 2 above, Li et al. disclose all the claimed limitations including the limitation step of forming a layer of third material on the planarized layer of material (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 13, as applied to claim 12 above, Li et al. disclose all the claimed limitations including the limitation wherein the planarized layer of material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 14, as applied to claim 1 above, Li et al. disclose all the claimed limitations including the limitation the step of doping the layer of first material prior to forming the layer of second material (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 15, as applied to claim 1 above, Li et al. disclose all the claimed limitations including the limitation wherein the layer of first material is doped polysilicon (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 22, Li et al. disclose a method of planarizing a layer of semiconductor material on a processed wafer (10), the wafer having a top surface (not labeled) , the top surface having a wafer lower level (not labeled) and a wafer upper level (not labeled) that lies above the wafer lower level, the method comprising the steps of: forming a layer of first material (16) on the top surface of the wafer (10), the layer of first material (16) having a top surface (not labeled), the top surface of the layer of first material (16) having a first lower level (not labeled) and a first

upper level (not labeled) that lies above the first lower level; forming a layer of second material (18) on the top surface of the layer of first material (16); and chemically-mechanically polishing the layer of second material and the underlying layer of first material until the layer of first material is substantially planar to form planarized layer of first material (see Fig. 2D), the planarized layer of first material (16) covering the wafer upper level (not labeled) of the top surface of the wafer (10); and forming a layer of third material (102) on the planarized layer of the first material (16) (see Fig. 2D), the third layer of material lowering a resistance of the first layer of material (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 19, as applied to claim 22 above, Li et al. disclose all the claimed limitations including the limitation wherein the first lower level lies above the wafer upper level (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 20, as applied to claim 19 above, Li et al. disclose all the claimed limitations including the limitation wherein the planarized layer of first material has a thickness over the wafer upper layer, and wherein the layer of first material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 21, as applied to claim 22 above, Li et al. disclose all the claimed limitations including the limitation wherein the first material is doped polysilicon (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 23, as applied to claim 22 above, Li et al. disclose all the claimed limitations including the limitation wherein the layer of first material makes an electrical contact with a device on the wafer (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 24, Li et al. disclose a method for forming a planarized layer of material on a processed wafer, the wafer having a top surface, the top surface having spaced-apart wafer upper levels a wafer lower level that lies between the wafer upper levels, the wafer upper levels lying above the wafer lower level, the method comprising the steps of: forming a layer of first material (16) on the top surface of the wafer (10), the layer of first material (16) having a top surface, the top surface of the layer of first material having a first lower level and a first upper level that lies above the first lower level; forming a layer of second material (60) on the top surface of the layer of first material (16); and chemically-mechanically polishing the layer of second material (18) and the underlying layer of first material (16) with a slurry until the layer of second material (18) is all removed from the layer of first material (16) to form the planarized layer of material; and wherein the layer of first material makes an electrical contact with a device on the wafer, the planarized layer of material lying over the wafer upper levels and the wafer lower level; selectively etching the planarized layer of material that covers (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 25, as applied to claim 24 above, Lin et al. disclose all the claimed limitations including the limitation the step of forming a layer of third material on the planarized layer of material, the layer of third material and the layer of first material being selectively etched during the selectively etching step (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 26, as applied to claim 24 above, Lin et al. disclose all the claimed limitations including the limitation wherein the layer of third material is conductive (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 27, as applied to claim 24 above, Lin et al. disclose all the claimed limitations including the limitation wherein the layer of first material and the layer of second material are etched with a slurry that etches the layer of first material and the layer of second material at approximately a same rate (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Re claim 28, as applied to claim 24 above, Lin et al. disclose all the claimed limitations including the limitation wherein all of the layer of second material is removed during the chemically-mechanically polishing step (see Figs. 2A-2I and Col. 4, line 37 through Col. 6, line 54).

Allowable Subject Matter

10. Claims 9 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments with respect to claims 22 and 24-28 have been considered but are moot in view of the new ground(s) of rejection that was necessitated by the amendment filed on March 11, 2003 in Paper No. 16.

12. Applicant's arguments filed on March 11, 2003 with respect to claims 1, 2, 5-7, 10, 13-16 and 18-23 have been fully considered but they are not persuasive.

With respect to the claims rejection under 35 U.S.C. § 112 2nd Paragraph , i.e., claims 5, 13 and 20, the Examiner respectfully submits that the rejected claims lack clarity in the meaning and scope because it is not clear to one of ordinary skill in the art that the meaning of “value” as recited in the claims and shown in Paragraph 6 herein above.

Applicant’s argument with respect to claims 22 is moot due to new ground of rejection that necessitated by amendment as applied in Paragraph 4 herein above.

With respect to claims rejection under 35 U.S.C. §102(e), i.e., claims 1, 2, 5-7, 10, 13-16, applicant argued that “The Li reference, however, fails to teach that the polishing step stops when oxide layer 18 (the layer of second material) has substantially all been removed. As taught by Li, “[t]he oxide polishing may occur only during the “ramp-up” period at the start of the polishing operation.” (See column 5, lines 23-25 of Li.) As a result, the Li reference does not teach that the polishing step stops when oxide layer 18 has been substantially all removed, but instead teaches that oxide layer 18 is removed at the beginning of a polishing step that continues with the planarization of polysilicon layer 16 until the structure shown in FIG. 2D has been formed. Thus, since Li does not teach that the polishing step stops when oxide layer 18 has substantially all been removed, claim 1 is not anticipated by the Li reference...” In response to the applicant’s argument, the Examiner respectfully submits that such an argument is not commensurate with the scope of the claims, in particular, as stated above. Li et al. disclose all the claimed limitations as recited in claim 1, 2, 5, 6, 7, 9, 10, and 13-23 as applied in Paragraph 9 herein above. In response to applicant’s argument that “Li fails to teach that the polishing step stops when oxide layer 18 (the layer of second material) has substantially all been removed,” the Examiner respectfully submits that neither claim 1 nor claim 22 recites the limitation “that the

polishing step stops when oxide layer (the layer of second material) has substantially all been removed.” In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the polishing step stops when oxide layer (the layer of second material) has substantially all been removed) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Although the rejected claims did not recite the alleged subject matter, (i.e., that the polishing step stops when oxide layer 18 (the layer of second material) has substantially all been removed), Li et al. disclose that the polishing step stops when oxide layer 18 (the layer of second material) has substantially all been removed (see Figs. 2D and 2H). Therefore, the rejection under 35 U.S.C. §102(e) is deemed proper.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure Chisholm (US/5,560,802), Hayashi (US/5,688,720), Bothra et al. (US/5,783,488), Chen (US/5,872,043), Jang et al. (US/6,197,660), Doan et al. (US/6,331,488), and Lee et al. (US/6,348,415) also disclose similar inventive subject matter.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Correspondence

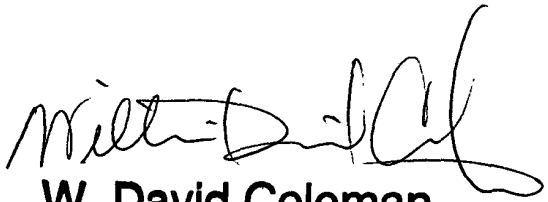
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (703) 306-4511. The examiner can normally be reached on 8-5 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Brook Kebede


May 28, 2003


W. David Coleman
Primary Examiner
Tech Center 2800